

# **Environmental Energy Technologies Division**

## **ES&H Self-Assessment Report for FY2008**

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# **Environmental Energy Technologies Division**

## **ES&H Self-Assessment Report for FY08**

### **I. Executive Summary**

#### **I.1. Division ES&H Structure**

##### **I.1.1 Overview**

The Environmental Energy Technologies Division (EETD) Environment, Safety & Health (ES&H) program structure consists of the Division Director, the Assistant Division Director for ES&H and Space (ADD) (representing Division senior management and chair of the Safety Committee), the Division Safety Coordinator (DSC), and the Safety Committee. The Division has five research Departments. These five Departments are further divided into 28 research facilities. Each research facility has a particular research focus, and a relatively unique set of tasks, hazards and controls. With some exceptions, each research facility has its own Job Hazard Analysis (JHA) Work Group associated with it. Each research facility conducts research in one or more buildings and rooms, has one or more Principal Investigators (PIs), and one or more Work Leads. Each room (Technical Area) has an Area Safety Leader assigned to coordinate safety issues. The Area Safety Leader is typically the same person as the Facility Work Leader. PIs, Work Leads, Area Safety Leaders, and Technical Areas are further defined in PUB-3000, Sect. 1.9, <http://www.lbl.gov/ehs/pub3000/CH01.html#sec19>.

##### **I.1.2 Division Council**

The Division Council is responsible for Division management, and consists of the Division Director, the Deputy Division Director, the ADD, the Business Manager, the Program Development Office Leader, the Division Senior Advisor, and the heads and deputies of each of the five research departments. The principal means of communicating within the Division regarding health and safety issues are through the DSC and the ADD, Division Council meetings, and the Safety Committee. The ADD discusses safety issues at every Division Council meeting by way of a standing safety agenda item. The Division Council nominally meets weekly. The DSC attends the Division Council meeting periodically to present and discuss safety reports and issues as needed.

##### **I.1.3 Division Safety Committee**

The Division Safety Committee is composed of the ADD (chair), the DSC, the Division Senior Advisor, the Division Business Manager, the EETD representative on the SRC, and the EH&S Division Liaison. There are two Safety Sub-Committees, one representing laboratory-type operations and the other representing non-laboratory operations. Each of these sub-committees has 6 or 7 members, including representatives from each relevant Department. The Safety Committee nominally meets quarterly or more frequently when issues arise. The Committee has been meeting weekly from 9/25/08 through December, due to the DOE HSS audit preparation efforts. The Committee discusses pertinent ES&H issues, and reviews the DSC's safety reports. Meeting minutes are posted on the EETD ES&H website. A direct communication link from the Safety Committee to senior Division management is provided through the Safety Committee members who are also members of the Division Council. Communication from the Safety

Committee down to employees is provided through numerous communication channels to help assure distribution.

#### **I.1.4 Self-Assessment Process**

The Division Self-Assessment (SA) approach is a combination of ongoing periodic inspections and a more comprehensive annual facility Self-Assessment Checklist.

The on-going inspections are done by the DSC and by line management. The frequency of the DSC safety walkthroughs depends on the activities in the labs, and the issues on hand. A few labs are inspected only once or twice a year, most labs are inspected quarterly, and a few labs are inspected monthly or more frequently. Line management walkthroughs are focused primarily on PIs doing walkthroughs of their spaces quarterly, and secondarily on senior management walkthroughs of selected spaces recommended quarterly. Line managers use a Lab Safety Inspection Checklist tailored to EETD (<http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls>), and they are encouraged to invite Division safety staff on their walkthroughs. [See Appendix 1 for a list of all supporting documents available online with links.]

The more comprehensive annual ES&H SA Checklist is sent to the PIs and Work Leads of each of the Division's 28 research facilities. The Checklist includes questions on waste minimization, and offsite work. Normally, the annual Self-Assessment Checklist is seven pages, with a three-page occupational safety checklist supplement sent to those facilities that have machine tools or shops. This year, to avoid redundancy with the unusual number of audits and reviews (including the activities associated with the upcoming DOE HSS audit), a special abbreviated annual checklist was used. The abbreviated 2008 SA Checklist can be downloaded at [http://eetd.lbl.gov/EHS/docs/2008SA\\_ChecklistEETD.xls](http://eetd.lbl.gov/EHS/docs/2008SA_ChecklistEETD.xls). The annual SA process includes updating the HMS database and updating the chemical inventory.

#### **I.2. Goals and Objectives**

The principal goal of the Division's ES&H effort is to ensure that all research activities in the Division are conducted safely and in compliance with the applicable federal, state, local, and Laboratory standards. Recognizing that much of the responsibility rests with the Division, our efforts focus on working with the Division scientific and supervisory staff to successfully meet these responsibilities.

To this end, our objectives are to: i) ensure that all Division staff recognize and act upon their ES&H responsibilities; ii) support these activities with oversight by Division management, the Safety Coordinator and the Safety Committee; iii) provide advice, necessary solutions, tools, etc. to all responsible parties within Division; and iv) collect data and maintain records for Division and Laboratory use, such as for trend tracking, periodic reports, the annual SA report, and Laboratory audits.

#### **I.3. Conclusions**

Overall, the Division's safety performance was good. Evidence shows that EETD's safety program is mature, effectively founded on the ISM principles, and provides a safe work environment for its staff. Formal authorization reviews were thorough and frequency was appropriate to the authorization. The DSC inspected all lab spaces approximately quarterly. PIs

are doing their quarterly lab walkthroughs, mostly on time, and they are documenting their walkthroughs on the EETD Lab Safety Inspection Checklists posted in each lab. Senior Division Managers, with the possible exception of one, conducted walkthroughs during FY08, but generally less frequently than quarterly. Job Hazard Questionnaire (JHQ) and Job Hazard Analysis (JHA) compliance rates were excellent, and training compliance was very good. Ten of the 15 opportunities for improvement and recommendations from the FY07 SA Report and technical reviews have been completed (as detailed in Sect. II.2). SAA compliance worsened to only fair. Waste quality assurance improved tremendously to a perfect score.

CATS has become a necessary and important tool to track corrective actions. The Division has made significant improvements with getting issues and corrective actions entered into CATS. However, the complexity of the CATS system continues to be an impediment to full implementation. Although each institutional upgrade to CATS has made the system more encompassing and powerful with its new data entry and analysis features, the Division is concerned that the time it takes to enter each deficiency into the system also increases with each upgrade, further straining division resources. This year, with the increased number of audits, reviews, and lab stand-downs, most of the burden of entering issues into CATS had to be passed on from the DSC to the users. Initially, about 80% of the user CATS entries were incomplete or improperly entered to the point where the issue failed to progress through the system. The DSC wrote a [CATS Primer](#) document that was distributed to PIs and Work Leads, and posted on the EETD ES&H website. This resulted in entry errors dropping to low numbers and improved compliance with entering CATS items in a timely manner. This set of step-by-step instructions was tailored to typical EETD entries and ignored unnecessary fields. Despite this attempt to make a simple set of instructions, the document was still 2-1/2 pages long, which indicates how complicated the CATS system has become.

As in past years, Facilities' response to corrective actions ranges from good to very poor. The most common complaint about Facilities from our staff is the excessive time taken to complete work orders.

## **II. Effectiveness of Division ES&H Programs**

### **II.1. Accomplishments and Noteworthy Practices**

- We continue to enjoy productive relationships with staff in the EH&S Division, especially the EH&S Division Liaison to EETD and the Waste Generator Assistant; but also including Subject Matter Experts in the areas of electrical safety, chemical hygiene, laser safety, and SAA compliance. These latter issues are key potential hazard areas within EETD.
- The Division conducted 4 all-hands meetings, all of which had safety as an agenda item. The Division Director continues to clearly articulate his commitment to safety and his expectations for safety from the Division staff.
- The Assistant Division Director for ES&H and Space is a member of the Division Council. ES&H issues are presented and discussed at each Division Council meeting. The Assistant Division Director is also a member of the Laboratory's Safety Review Committee, and this provides an important communications channel between the Division and the Laboratory.

- EETD allotted sufficient resources to continue a strong presence of the DSC "in the field," providing both informal inspections and safety reviews, and 'on-the-spot' advice. The presence of the DSC also helps improve communications between the research staff, Division management and ES&H personnel. All of the Division's lab and shop spaces are inspected by the DSC at least once per year, and typically every few months. The Assistant Division Director also conducts walkthroughs of Division space on a regular basis. Deficiencies are generally tracked in CATS.
- The completion rate for required training courses was 89% on 10/1/08 and increased to 95% as of 12/15/2008. (The completion rate was 92% at the end of FY07.) The overall compliance rate for JHAs was 98% on 10/1/08 and currently is 96% (as of 12/15/2008). (The JHQ compliance rate was 92% at the end of FY07.) The Division management, in cooperation with the Human Resources Department, has a policy to not renew employment terms for Guests and Visitors until their JHAs are current and all required training is completed or scheduled. The active role of Division management, continuous efforts of the DSC, and improvements in the on-line JHA process have contributed to a significant improvement in the JHA compliance rate in the past year.
- Again this year, our radiation authorizations (1 RWA, 1 SSA, 7 GLAs, and 1 X-Ray) have all been renewed on time, have had no major deficiencies, and have 100% completion on required training. Our 11 active AHDs have a 94-97% training completion rate.
- EETD had a 100% waste Quality Assurance (QA) pass rate for FY08. This is a great improvement over the red scores received in both FY06 and FY07. EETD had no Nonconformance and Corrective Action Reports (NCARs) issued by Waste Management and no environmental violations or unplanned releases.
- The Division participates in "Green Purchasing" and mandated the use of recycled paper on a Division-wide basis. In the Division's two largest buildings, 70 & 90, dedicated collection areas have been established to promote and ease recycling and proper disposing of materials. A waste minimization reminder question is included in the annual Self-Assessment Checklist. Normally various waste streams are evaluated each year to identify potential waste minimization opportunities, however, this process was preempted this year due to JHA implementation and DOE audit preparation activities.
- EETD continues to maintain the meticulous process of record keeping, which is critical for assessing long-term performance of specific facilities as well as Division programs. Databases maintained by the DSC provide a full overview of all the Division research facilities, including key personnel, space assignments, authorizations, and notes on action items. The databases also track many key self-assessment metrics, and serve as a primary source of information to identify potential problems and long-term trends.
- Ongoing accident prevention efforts have helped keep the accident rate at a very low level. Only 3 injuries were reported during the FY08 performance period. One of the 3 injuries was ergonomic related, and 1 of the 3 was recordable (not ergonomic). Our 13-year average is 6.9 injuries per year, with 54% of these related to ergonomics, and 34% recordable. The Division Safety Coordinator reviews occurrence reports, exposure reports, safety notices,

injury and accident rates, and “lessons learned” reports; and as part of our accident prevention efforts, acts upon them and redistributes the information to the Division personnel, as appropriate.

- The Division has an ergonomics policy detailed in the ISM Plan. Using ergonomic evaluators from EETD and EH&S, the Division has an active workstation ergonomic evaluation program. A total of 310 Division personnel have completed the Remedy Interactive ergonomic workstation evaluation (EHS0059).
- PIs and laboratory staff maintain their chemical inventories on an on-going basis. Help from EH&S chemical inventory staff is used when needed. Of the 37 chemical owners in EETD, 32 (holding 99% of the total chemicals) have updated their chemical inventories since the beginning of FY08. The 5 chemical inventories that were not updated during this time period are all small and static inventories.
- The Division maintains a website (currently being updated) specifically for safety items pertinent to our Division. The EETD ES&H website (<http://eetd.lbl.gov/EHS/EHS.html>) includes the Division ISM Plan, walkthrough checklists, minutes of Safety Committee meetings, charters, a list of acronyms, Division ES&H staff contact information, a synopsis of the new PPE and food policy, CATS instructions, and HSS audit preparation documents. The website is periodically updated with additional and revised information.
- EETD has established a Safety SPOT award program that recognizes exemplary performance and commends groups or individual employees that expend extra effort to conduct work operations in a safe and pollution free manner. In addition to adhering to all LBNL safety regulations and ensuring that personnel are adequately trained and motivated, the candidates are selected for going beyond the call of duty to enhance safety and environmental protection within the Division. Examples of notable performance include: identifying near-miss situations and new potential work hazards, fast response to safety issues, voluntary preventive actions etc.

The objectives of this program are to:

- Elevate awareness of safety & pollution prevention in EETD
- Encourage compliance with safety regulations
- Provide personnel with a better understanding of job-related hazards
- Enhance protection of personnel and equipment

The award nominations are reviewed, selected and approved by the ADD, DSC, and Division Director. Award winners are officially recognized at EETD Townhall Meetings. Three EETD Safety Spot Awards were granted since its establishment in Jan 2008.

- The Division has established a pilot program of recording and analysis of near hit situations. The goal of this program is to strengthen the feedback part of ISM, and identify possible patterns in the safety risks and deficiencies that need to be addressed on the Division level to prevent accidents and injuries. EETD requires that all near hits be reported by supervisors to the DSC. The DSC collects all reports, includes them into the database, and processes the information, looking for possible coincidence. All near hits are reported to the EETD staff

via the What's New newsletter and are posted on the EETD website in the ES&H section. The Division Safety Committee reviews and evaluates near hit information provided by the DSC quarterly. Annual analysis of near hits and implementation of corrective actions will be part of our future self-assessment process. EETD Safety SPOT award can be granted for exemplary performance in recognizing and reporting near hit situations.

## **II.2. Status and Progress on Corrective Actions for Issues Identified in PY07**

### **Opportunities for improvement or corrective actions identified in the Office of Contract Assurance (OCA) Validation Report for PY2007**

Opportunities for improving EETD's FY08 self-assessment process include:

**II.2.1** Ensure that performance is analyzed. In general, the Division did an outstanding job in analyzing performance. One exception is analysis of ergonomic safety performance. The report details 6 ergonomic-related injuries during a recent 15-month period and discusses ergonomic training completion. The Division could provide further analysis by determining if injured staff had received the referenced trainings and exploring answers to the questions posed under the Control Hazards Opportunities for Improvement (p.17).

*Responsible Person: Guy Kelley*

*Status: Complete.*

- *Training analysis was completed and all 6 staff with ergonomic injuries had completed their ergonomic training prior to their injuries. Results were reported to OCA.*
- *Exploring answers to ergo improvement questions primarily completed and satisfied by the introduction of the new online Ergonomics Database.*

**II.2.2** Track corrective actions for issues identified in FY06 in CATS. The Division provided details on corrective actions developed to address hazardous waste deficiencies. However, these corrective actions were not tracked in CATS. Tracking in CATS is especially important in this case because the waste management issue is a repeat finding from FY05.

*Responsible Person: Guy Kelley*

*Status: Complete*

- *Both SAA and Waste QA performance issues from FY06 Self-Assessment were entered into CATS (Issues Nos. 6518 & 6519). (SAA compliance rate improved into the green zone during FY07, and Corrective Action has a closure date of 9/30/07. Waste quality assurance remained below green during FY07, but improved to 100% for FY08. Corrective Action has a closure date of 9/30/08.)*

**II.2.3** Track divisional opportunities for improvement identified in FY07 Division Self-Assessment Report and workspace safety deficiencies in CATS. In general, EETD is very diligent in tracking issues and corrective actions in CATS. However, the Division self-identified that not all findings are entered into CATS in a timely manner. It is noted that difficulties with the utility of the new database must be addressed to properly support EETD in this effort.

*Responsible Person: Guy Kelley*

*Status: Incomplete*

- *None of the 15 FY07 Opportunities for Improvement have been entered into CATS due to time*



*constraints (and the poor functionality of the CATS system). Issues are being addressed outside of CATS as detailed in this Section II.2.*

**Divisional Findings:**

**II.2.4** Address ergonomic issues, including more timely implementation and follow-up of corrective actions

*Responsible Person: EETD Ergo team*

*Status: Complete*

- *Use of Remedy Interactive and new Ergo Database implemented.*

**II.2.5** Improve hazardous waste quality assurance

*Responsible Person: Guy Kelley and EETD Waste Generators*

*Status: Complete*

- *FY08 waste QA performance was 100%.*

**II.2.6** Improve timeliness of entering findings and corrective actions into CATS

*Responsible Person: Guy Kelley, and EETD PIs and Work Leads*

*Status: Partially complete*

- *Early in FY08, many CATS entries were still not made in a timely manner (mainly due to time constraints and poor functionality of the CATS system). However, by the end of this review period, most issues are being entered into CATS in a timely manner.*

**II.2.7** Improve staff completion rate for AHD required training

*Responsible Person: Guy Kelley*

*Status: Complete*

- *AHD required training completion rate increase from 92% to approximately 96% in FY08.*

**Divisional Process Improvements:**

**II.2.8** Improve process to identify and evaluate hazards associated with offsite work. (This is closely linked with the institutional opportunity for improvement noted below.)

*Responsible Person: Guy Kelley*

*Status: Incomplete.*

- *Offsite work is being tracked and analyzed by use of the EETD Offsite Safety Review form. The robustness of the analysis of tasks, hazards, and controls needs improvement.*

**II.2.9** Continue efforts to improve JHQ and training compliance rates

*Responsible Person: Guy Kelley*

*Status: Complete*

- *JHA compliance rate is currently 96%. Training completion rate is currently 95%.*

**II.2.10** Increase line management participation in ES&H

*Responsible Person: Guy Kelley and Division Senior Management*

*Status: Complete*

- *Senior Line Management participation in safety has been very active in Division Council meetings, the implementation of the new JHA system, planning for the numerous recent audits and reviews, etc. Senior Line Management participation in safety walkthroughs has also been good, but could still be improved. This will be a target improvement for FY09. All Senior Line Managers conducted several walkthroughs during FY08, with the possible exception of one Department Head who has not been available recently to be polled.*
- *The Division expects PIs to conduct walkthroughs of their spaces at least quarterly, and most PIs have complied. Quarterly walkthrough checklists are left in a document pocket inside the door to every lab.*

*(Line management is defined as anyone who has authority to allocate resources. In EETD, this generally refers to PIs up through the Division Director.)*

- *The Division's plan of action has been and will continue to be as follows:*
  - *The Division Director, Assistant Director, and Department and Program Heads will continue with periodic safety walkthroughs of lab space, recommended quarterly.*
  - *Senior Division management will include ES&H agenda items in all-hands meetings, department meetings, and in Division Council meetings.*
  - *Department Heads will encourage their PIs to regularly participate in safety related activities such as*
    - *periodic safety walkthroughs of their spaces (quarterly),*
    - *discussion of safety related issues during group meetings, and*
    - *correcting deficiencies with CATS items, SAAs, and training.*
  - *Encouragement for line management participation in ES&H will be included whenever possible in ES&H related communications.*
- *Line Management participation in ES&H and safety "buy-in" by all staff will always be challenging objectives for a research division where personnel tend to focus on their research activities, worry about their funding sources, and race to meet their research-related deadlines. The great accomplishments that EETD made since 1998 are evidenced by the continuous progress in improving the "safety consciousness" and safety participation of our staff. We attribute this to efforts outlined in the above plan of action and the frequent interaction of the Safety Coordinator with Division staff. Also, the support and active participation of senior line management directly impacts the perception of safety for all personnel. (Safety was a topic at 2 of 3 Division all-hands meetings during FY08.)*

#### Institutional Opportunities for Improvement:

**II.2.11** Improve ergonomic database to prompt re-evaluations for staff moves

**II.2.12** Develop policy for off-site work. Establish standards for hazard identification, analysis, and control.

Opportunities for improvement or corrective actions identified in the EETD PY2007 Self-Assessment Report, but not identified in the Office of Contract Assurance (OCA) Validation Report

#### **II.2.13** Publicize ISM Plan before the end of the fiscal year.

*Responsible Person: Guy Kelley*

*Status: Complete*

- *The ISM Plan has always been posted on the EETD ES&H website, but was not specifically publicized to the whole Division before the end of FY07. In FY08, the ISM Plan was publicized to the whole Division in the 11/14/07 issue of What's New in EETD, and the 2008 revision was publicized Division-wide on 12/19/08. The Plan was also publicized to all research facility staff in the annual 2008 Self-Assessment Checklist.*

#### **II.2.14** More timely reviews of AHDs to avoid the need for extensions to expiration dates. (No adverse conditions or violations occurred due to this.)

*Responsible Person: Guy Kelley*

*Status: Complete*

- *All EETD AHDs were renewed on time except for 2. These 2 were both 4 days late with no consequences.*

#### **II.2.15** Improve the 80% completion rate for EHS0026, Supervisor Training.

*Responsible Person: Guy Kelley*

*Status: Incomplete.*

- *EHS0026 completion rate is currently at 87%.*

### **II.3. Significant or Recurring ES&H Issues**

*Offsite work hazards.* There is a serious concern that our present system does not fully identify hazards and controls associated with the offsite work performed by Division personnel. The Division has in place an Offsite Safety Review form and review procedure. Further efforts are still needed to bolster the analysis of hazards and controls in this process, and to assure that all offsite work is being captured and evaluated.

*SAA Performance.* Considerable efforts during PY07 to improve SAA and waste QA performance succeeded with significantly improving SAA performance, but failed to improve QA performance. FY08 saw the opposite trends: SAA performance dropped to 88% and waste QA compliance increased to 100%. The Division will focus efforts on stepped up monitoring of SAAs, and educating waste generators and associated PIs to improve SAA compliance.

### **II.4. Possible Root Causes**

As described last year, the difficulty in obtaining a consistent and appropriate degree of attention to ES&H issues within the Division appears to stem from several factors. An important – possibly the predominant – factor is the safety ‘culture’. Until the last several years, safety issues often did not receive the level and consistency of attention required. This is also true in terms of incorporating recent changes in safety procedures into projects initiated years ago. However, with continued line management “buy-in”, and as new personnel with a higher level of safety awareness replace older, more rigid staff, the safety culture is improving in the Division. More importantly, the recent DOE HSS audit preparation activities have resulted in a profound improvement with the Division safety culture. These activities have included lab stand-downs,

ISM training sessions, mock audits, improvements with house keeping and storage, and greatly increased visibility of safety in Lab and Division communications and meetings.

A Lab-wide policy on ergonomics has been lacking. Computers are purchased, new staff is placed in offices, and existing staff move from office to office - all without an automatic concern or allotment of resources for ergonomics.

There has also been little Lab-wide guidance on analysis of offsite work. Tracking the presence and nature of offsite work has been difficult. This issue has been identified by EH&S and the SRC, and a lab-wide process has been initiated. Planned Division improvements in this area will be a focus point for FY09.

## **II.5. Corrective Measures Planned For FY09**

### **Specific “high effort” activities:**

**II.5.1 Offsite Work Reviews.** The Offsite Safety Review Forms will be improved to increase the robustness of the analysis of offsite work tasks, hazards, and controls. We will work further with Division management and research staff to assure that all groups who conduct offsite experimental work (other than work on UCB Campus) use the Division’s Offsite Safety Review form, and that the DSC reviews the offsite work. The objective is to improve tracking and identification of offsite work, and ensure that offsite work hazards are identified and controlled. The Division will cooperate with the new Lab-wide effort to deal with this issue on an institutional level.

**II.5.2 SAA Performance.** Considerable efforts during PY07 to improve SAA and waste QA performance succeeded with significantly improving SAA performance, but failed to improve QA performance. FY08 saw the opposite trends: SAA performance dropped to 88% and waste QA compliance increased to 100%. The Division will focus efforts on stepped up monitoring of SAAs, and educating waste generators and associated PIs to improve SAA compliance.

### **Specific “moderate effort” activities:**

**II.5.3 CATS Tracking and Closeouts.** Increased effort will be made to provide more prompt entry of deficiencies into CATS after inspections. In addition, specific follow-up activities – such as verification visits by the Division Safety Coordinator – will be undertaken. As appropriate, we will work with Facilities and EH&S to resolve issues that have caused extensive and frustrating delays in evaluating and closing findings. A significant advantage of the CATS system is that it sends out automatic reminders at specific intervals.

**II.5.4 Line Management Participation in ES&H.** Walkthroughs by senior Division management (recommended quarterly) will continue to be a target. The Division will explore new methods to track these walkthroughs. Other elements of the plan of action discussed earlier, such as promoting safety as an agenda item at meetings, will continue to receive attention. A good program for quarterly walkthroughs by PIs is in place (with EETD Lab Safety Inspection Checklists posted near the door of each lab), and monitoring of this program for compliance will be continued.

**II.5.5 JHA and Training Completion.** We will work with supervisors and other staff to meet the training requirements identified in the JHA process and in specific work authorizations.

Focus will include EHS0026, Supervisor Training. The Assistant Division Director for ES&H and Space and the Division Safety Coordinator need to continue to monitor the JHA compliance and training completion across the Division and send periodic reminders to personnel. We will attempt to speed the training of new hires and keep focus on “mission critical” training, such as that required by AHDs (currently at 96%) or for other specific work functions,

### III. FY 2008 ES&H Performance Criteria

#### Environmental Energy Technologies Division

EXPECTATION	VALIDATION	DIVISION SYSTEMS
<b>1. DEFINE WORK</b>		
E1. Division revises division ISM plan to reflect a) ES&H policy changes (including Work Lead responsibilities), and b) updates to the Institutional ISM plan. Line management communicates updates to the plan to division personnel	<p>Division ISM plan updates should reflect PUB-3000 and Institutional Integrated Safety Management System (ISMS) plan changes made subsequent to the last revision of the division ISM plan and through June 30, 2008.</p> <ul style="list-style-type: none"> <li>• PUB-3000: Refer to the LBNL/PUB-3000 Change Record for calendar year 2008 changes and LBNL/PUB-3000 Change Archive for pre-calendar year 2008 changes, as appropriate.</li> <li>• Institutional ISMS plan: Refer to LBNL/PUB-3140 Integrated Environment, Health and Safety Plan/Integrated</li> </ul>	<p>D1a) The <a href="http://eetd.lbl.gov/EHS/safety/eetd-ism-plan.html">Division ISM Plan</a> is updated at least annually. The latest update was on 12/15/08. The current version is online at <a href="http://eetd.lbl.gov/EHS/safety/eetd-ism-plan.html">http://eetd.lbl.gov/EHS/safety/eetd-ism-plan.html</a>. The revised Plan reflects updates that are relevant to EETD that were made to the Institutional ISM Plan through September 2007 (the latest version), and to PUB-3000 through FY08. As per Kem Robinson's 10/9/08 memo to Division Directors, we will do a further update to our ISM Plan by 1/23/09. In this January update, we will further reorganize our Plan to match an institutional template that has been distributed by Bill Wells in EH&amp;S.</p> <p>D1b) Because of the nature and diversity of EETD research, EETD ES&amp;H policy, as reflected in the Division ISM Plan, is communicated through a variety of channels. Group and Department meetings are not the norm. Many of our research groups are small and may be composed of only 1 or 2 people. Because of this, we have developed a strong and diverse safety communication program that targets specific groups, such as SAA Responsible Persons, PIs, Research Facility Managers, laser users, chemical users, or the Division personnel as a whole.</p> <p>Other communication channels include all-hands meetings (4 were held during FY08), walkthroughs (particularly by the DSC, ADD, and the Division Liaison), the Division ES&amp;H website, <a href="http://eetd.lbl.gov/EHS/EHS.html">http://eetd.lbl.gov/EHS/EHS.html</a> (which contains the Division ISM Plan), self-assessment and periodic walkthrough checklists, formal authorization documents, a weekly electronic newsletter that</p>

EXPECTATION	VALIDATION	DIVISION SYSTEMS
E2. Per the Lab-wide implementation schedule, division ensures workers have a current Individual Baseline Job Hazards Analysis (JHA), authorizing regular and routine work that he/she performs, and if necessary one or more current Task-based JHA(s) to authorize unpredictable, short-term, or unusual work that is not included in the Individual Baseline JHA.	Safety Management (ISM) System, September 2007, Revision 6.	is sent to all EETD staff (called " <a href="#">What's New in EETD</a> " and also available (with back issues) on the <a href="#">Division web-site</a> ), the DSC's periodic safety reports to senior Division management, and annual performance reviews.
	V1a. Review our ISM Plan. Did we address all updates, as applicable?	Through all these communication means, EETD ES&H policy, as reflected in the Division ISM Plan, is communicated as needed to the relevant groups. For example, revised policy on the need for periodic safety walkthroughs by line management was directed to senior Division management as well as to PIs and Work Leads. Revised policy on injury investigation was communicated to Supervisors and injured employees during injury review meetings. Revised policy on formal authorizations and LBNL's management of AHDs was communicated to PIs and Work Leads with formal authorizations and to AHD users through the AHD approval process.
	V1b. How did we communicate changes to our ISM plan to the entire division?	PIs were asked during the Self-Assessment process to make sure all personnel working in their research facilities were familiar with the EETD ISM Plan. The Plan as a whole has not been publicized to non-research staff, however, this will be done in the 12/19/08 issue of What's New in EETD, which goes to all EETD staff.
	V1c. How effective was this communication?	D1c. See discussion in D1b above.
	V2a. Did we document our process for performing JHAs in our ISM Plan?	D2a. Yes. JHA procedures and expectations are discussed in the EETD ISM Plan, including Sect. 3 (PI responsibilities), Sect. 5 (DSC reporting responsibilities), Sect. 6a (scope of work), Sect. 6b (offsite work), and Sect. 7 (qualifications and training).
	V2b. What percentage of staff have a current Individual Baseline JHA?	D2b. The overall compliance rate for JHAs was 98% on 10/1/08 and is 96% as of 12/15/08. (The JHQ compliance rate was 92% at the end of FY07.)
	V2c. What percentage of required staff have a current Task-based JHA?	D2c. Task-based JHAs are current for all staff where required. In EETD, Task-based JHAs are a requirement for off-site experimental work (other than at UCB). The Task-based JHA is achieved by use of an Offsite Safety Review form, which lists relevant formal authorizations, hazards, OJT, and users. We are not aware of anyone conducting offsite experimental work who has not had their work analyzed on the Offsite Safety Review form, but the Division has a FY09 goal of improving assurance that all offsite experimental work is being captured. There is also a FY09 goal to improve the robustness of the analysis of tasks, hazards, and controls for offsite work.

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<p>What noteworthy accomplishments in the ISM core function #1, <i>Define Work</i> did we achieve?</p> <p>What opportunities for improvement in the ISM core function #1, <i>Define Work</i> exist?</p>		<p>The Division ISM Plan was revised to reflect updates to ES&amp;H policy expressed in PUB-3000 and the Institutional ISM Plan. A wide variety of communication channels are used to communicate various aspects of the Division ISM Plan to pertinent Division personnel.</p> <p>The Offsite Safety Review Forms will be improved to increase the robustness of the analysis of offsite work tasks, hazards, and controls. We will work further with Division management and research staff to assure that all groups who conduct offsite experimental work (other than work on UCB Campus) use the Division's Offsite Safety Review form, and that the DSC reviews the offsite work. The objective is to improve tracking and identification of offsite work, and ensure that offsite work hazards are identified and controlled.</p>
<b>2. IDENTIFY HAZARDS</b>		
<p>E3. Divisions review work activities to identify, analyze, and categorize hazards and environmental impacts for the associated work. Examples of hazard inventory include: Hazards Management System (HMS) database (or equivalent), project safety review, workspace safety review, Job Hazard Analyses (JHA), environmental review (NEPA/CEQA), and chemical inventory.</p>	<ul style="list-style-type: none"> <li>Review division's hazard identification and inventory documentation.</li> </ul> <p>V3a. Did we review our work activities to identify, analyze, and categorize hazards consistent with Lab policy?</p>	<p>D3a. 97% of the annual Self-Assessment Checklist packages (which are completed by the PI and/or Work Lead) were completed by the Division's research facilities during this review process.</p> <p>100% of the Division's lab space was inspected by the DSC at least once and typically about quarterly during the review period.</p> <p>PIs conduct quarterly walkthroughs of their spaces using the EETD Lab Safety Inspection Checklist (<a href="http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls">http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls</a>). The completed checklists are kept in a document pocket inside the door of their labs. Issues not corrected on the spot are entered into CATS.</p> <p>All senior Division management (including the Division Director, Assistant Division Director, and Department Heads) are informed of the expectation to do periodic walkthroughs of their spaces, recommended quarterly. All Senior Division Managers have done at least one walkthrough during this review period with the possible exception of one Department Head who is not available for poling.</p> <p>Most of the Division office space has been inspected by the DSC, Department Heads, and Supervisors on a graded as-needed basis, and is generally only documented when deficiencies exist.</p> <p>As described in the Division ISM Plan, the Division's inventory of hazards and special equipment is maintained in the HMS database. The online system was used by EETD's 28 research facilities to review the inventory of hazards during our FY08 Self-Assessment process. Due to difficulties with the HMS database, some PIs were not able to record their reviews. This problem is currently being investigated. The DSC also makes spot checks of HMS information for all spaces.</p> <p>NEPA/CEQA forms and our Project Safety Review (PSR) forms also identify hazards and remind researchers to properly allocate resources for ES&amp;H each year when the project is renewed and for each new project. The PSR form can be found at <a href="http://eetd.lbl.gov/EHS/chem-hazards/docs/psr.rtf">http://eetd.lbl.gov/EHS/chem-hazards/docs/psr.rtf</a>.</p>



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<p>E4. Division participates in pollution prevention, energy conservation, recycling, and waste minimization programs, as appropriate for the environmental impact of their activities.</p>	<p>V3b. Do we have a specific hazards review process described in our ISM plan? If so, did we follow this process?</p> <p>V3c. How do we ensure our inventory is comprehensive (i.e. did we include all of our workspaces)?</p> <p>V4a. Complete the Environmental Review Checklist (Attachment 1), or similar process.</p>	<p>Also very important are the DSC's numerous visits to each experimental facility during the year. Thus he is very familiar with existing and any new hazards and potential adverse environmental impacts.</p> <p>Through regular communications, PIs know that they must maintain an up-to-date chemical inventory and perform peroxide former testing as required. This is reinforced during the Self-Assessment process.</p> <p>The above processes to identify hazards cover EETD's offsite work as well. However, considering the unique situations that can arise with offsite work, EETD has developed an Offsite Safety Review form to further assure the identification and control of offsite hazards.</p> <p>D3b. The EETD IDM Plan discusses hazard reviews, including the use of the CMS, HMS, JHA, Project Safety Review Form, and Offsite Safety Review Form. The processes were followed.</p> <p>D3c. The inventory is comprehensive as per discussion in D3a above. Regarding the chemical inventory, of the 37 chemical owners in EETD, 32 (holding 99% of the total chemicals) have updated their chemical inventories since the beginning of FY08. The 5 chemical inventories that were not updated during this time period are all small and static inventories.</p> <p>D4a. For many years, we have identified and tracked a number of waste streams that have waste minimization potential. Generally these waste streams are already using the most practical waste minimization procedures and equipment possible, and still allow research objectives to be met. We have continued to monitor each year these waste streams and associated procedures in an attempt to identify further reduction possibilities. This process was greatly reduced during FY08 due to activities associated with implementation of the new JHA system, and then with the DOE HSS audit preparation (not to mention numerous other recent audits, reviews and new policies).</p> <p>EETD's annual Self-Assessment Checklist, which goes to each of our 28 active experimental facilities, includes an environmental impact and waste minimization reminder (question #6). A link is given to the Environmental Review Checklist and the LBNL Waste Minimization website.</p> <p>The Division participates in "Green Purchasing"; and the Lab-wide program of placing paper, glass, plastic, and battery recycling containers in prominent locations in each building. Waste Minimization posters are scattered throughout the Division. The Division mandated the purchase of recycled paper for copiers/printers on a division-wide basis - this went into effect on April 10, 2007. We also sent a Division-wide What's New article on June 20, 2007 on how to save energy and linked to a list of a</p>

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		<p>dozen actions to save energy. The list is still on EETD's Intranet.</p> <p>In May 2007, a new 90-0096 Excess Room was put into operation, and widely publicized for all Bldg. 90 and 90-Trailer occupants. This new program is modeled after the Bldg. 70 loading dock collection area that EETD spearheaded a few years ago, and allows building occupants to recycle and dispose of property with no costs to them and minimal effort. Instructions and all necessary forms (Equipment Movement Tags, Universal Waste Labels, etc.) are provided in the Excess Room. Transportation and Waste Management make regular pickups.</p> <p>D4b. In Bldg. 90, an effort is underway to make paper recycling easier and to reduce the number of cans that custodians have to empty. A meeting was held recently with Joe Griffin, the custodial Group Leader, and several options were discussed to achieve the above result.</p>
<p>What noteworthy accomplishments in the ISM core function #2, <i>Identify Hazards</i> did we achieve?</p> <p>What opportunities for improvement in the ISM core function #2, <i>Identify Hazards</i> exist?</p>		<p>All workspaces are inspected to identify hazards, generally quarterly, by means of DSC walkthroughs, PI and Senior Management self-assessments, EH&amp;S technical reviews, and other special inspections. Hazards are inventoried by use of HMS, PSRs, NEPA/CEQA, formal authorizations, and the Chemical Inventory. A separate Offsite Safety Review Form is used to meet the more challenging task of identifying hazards in offsite work situations. An environmental impact reduction reminder question is included in the annual Self-Assessment Checklist. The Division participates in "Green Purchasing" and mandated the use of recycled paper on a Division-wide basis. The Division's two largest buildings, 90 &amp; 70, now have specific excess collection areas to promote and ease the task of recycling and disposing of materials properly.</p> <p>Senior Line Management walkthroughs, recommended quarterly, are only partially documented Division-wide. A better method to remind line management to conduct walkthroughs, and to document these walkthroughs should be considered. (Less than quarterly walkthroughs are being considered.)</p>
<b>3. CONTROL HAZARDS</b>		
<p>E5. Division ensures appropriate engineering and other safety/environmental controls are in place and properly maintained.</p> <p>Examples of controls include, but are not limited to:</p>	<p>V5a. How do we determine the need for engineering and other safety/environmental controls? Is this process effective?</p> <p>V5b. Did we properly identify (with</p>	<p>D5a. Engineering and other safety/environmental controls are mostly common knowledge. This is reinforced by numerous communications and reviews. Project Safety Reviews for new projects are very effective with determining the need for engineering and other controls. Other examples of systems to capture the need for these controls are the inspection checklists, AHDs, policy statements, and the JHAs.</p> <p>D5b. Engineering and other safety/environmental controls have been successfully and thoroughly identified. Here is an example: Recently, EH&amp;S fell seriously behind with their quarterly reviews and tests of the</p>

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<ul style="list-style-type: none"> <li>• Guards, barriers and shields</li> <li>• Fume hoods, glove boxes, biosafety cabinets</li> <li>• Interlocks</li> <li>• Exhaust system filtration</li> <li>• Secondary spill containment</li> <li>• Personal protective equipment</li> <li>• In-lab alarm monitors</li> <li>• Stack emission monitors</li> <li>• Lockout/tagout</li> <li>• Ergonomic workstation modifications (furniture, equipment and/or accessories)</li> <li>• Manual material handling lift assist devices</li> <li>• Cranes and hoists</li> </ul>	<p>assistance from EH&amp;S, as appropriate) engineering and other safety/ environmental controls?</p> <p>V5c. What actions(s) did we take to resolve deficiencies in this area, as applicable?</p>	<p>Bldg. 70 eye wash and safety shower stations. The out of date inspections were reported by about 10 of our PIs and Work Leads in the building.</p> <p>Other examples of systems that effectively identify the need for these controls include Laser AHDs which identify the need for interlocks, IH hazard exposure checks which have identified the need for local ventilation, a Division-wide LOTO review that identified the need for equipment specific procedures, and Remedy Interactive that identifies the need for ergonomic workstation modifications.</p> <p>D5c. Deficiencies were analyzed with help from EH&amp;S Subject Matter Experts and corrected. See discussion in D5a &amp; b above.</p>
<p>E6. Division ensures administrative controls are in place and maintained. Examples of administrative controls include: work authorizations (including but not limited to JHAs, AHDs, BUAs and RWAs), work permits (including but not limited to confined space, and energized electrical work), environmental permits,</p>	<p>V6a. Did we review formally authorized work on schedule?</p> <p>V6b. How did we address changes in work scope?</p> <p>V6c. Are our processes to ensure administrative controls are in place and maintained</p>	<p>D6a. All formal authorizations (11 AHDs, 1 RWA, 1 SSA, 7 GLAs, and 1 X-Ray) were reviewed on schedule with the exception of 2 AHDs. In both these cases, the review was completed 4 days late with no unauthorized work being conducted or other consequences.</p> <p>D6b. Our ISM Plan specifies that Line Managers are held accountable for these hazard controls. They are reminded through regular communications that they must have the authorization reevaluated by EH&amp;S staff whenever there are significant changes to hazards or work scope. All staff know they have the authority to stop work if unsafe conditions exist, including improper controls. Line management authority to suspend operations has been utilized from time to time when authorizations are not complete for new projects, or not renewed for continuing projects.</p> <p>D6c. The EETD ISM Plan, Sect. 6a, Scope of Work Authorized – General, addresses the JHA and the HMS. And Sect. 6c, Work Requiring Specific Approval, addresses formal authorizations.</p> <p>The procedures for developing and implementing hazard controls vary depending on the category of the hazard. Controls for hazards categorized as moderate and higher are implemented by way of</p>

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work procedures, and project safety reviews.	consistent with our division ISM Plan?	<p>formal authorizations, such as AHDs, RWAs, SSAs, X-Ray authorizations, etc. Formal authorizations are reviewed at regular intervals, and upon significant changes, depending on the authorization: AHDs are reviewed annually, RWAs and SSAs every 18 months, and X-Ray authorizations every 5 years. AHD expiration dates are tracked by the online AHD system and by the DSC, and renewal notifications are sent as appropriate.</p> <p>Administrative controls for our low hazard work are implemented by way of internally reviewing at least annually our self-authorized work (work not requiring formal authorizations). In other words, Division approval only is required for self-authorized or low hazard work. As spelled out in the EETD ISM Plan, this Division approval is accomplished by use of the JHA, and by the process of updating and reviewing the HMS database.</p> <p>PUB-3000, Chapter 6 is used as guidance for internal authorizations.</p>
E7. Division ensures that ergonomic hazards (computer, laboratory, and material handling) are adequately controlled and that employees and line management are knowledgeable and engaged in this process, including the early reporting of ergonomic pain or discomfort (before an injury). Ergonomic issues/concerns/discomfort/pain are reported promptly for immediate corrective action.	<p>V7a. Did we implement ergonomic safety policies and procedures as described in our ISM Plan?</p> <p>V7b. How do we communicate the importance of early reporting of discomfort and workload management as strategies for preventing ergonomic injuries?</p> <p>V7c. What is our completion rate for</p>	<p>D7a. The EETD ISM Plan, Sect. 5, Divisional Safety Oversight, contains considerable detail on the Division's ergonomic plan and requirements. This includes Remedy Interactive being required for personnel who work at a computer for more than an average of 4 hours per day; and the necessity for an ergonomic workstation evaluation whenever there is pain or discomfort, or when computer usage is more than an average of 4 hours per day.</p> <p>During FY08 EETD had only 3 injuries, and only 1 of these was ergonomic related. Over the last 13 years, EETD had an average of 6.9 injuries per year, and 54% of them were ergonomic related.</p> <p>EETD was the first Division to participate in the cost sharing pilot program for workstation ergonomics upgrades offered in December 2002 by Deputy Lab Director Sally Benson. The Division contributed 40% of the cost of the upgrades for 51 workstations.</p> <p>D7b. Early reporting and workload management are specifically identified as critical strategies for preventing ergonomic injuries in the EETD ISM Plan, Sect. 5.</p> <p>An EETD Ergonomics Action Plan was drafted in 1999 and has evolved into a Division policy as stated in the ISM Plan. Key elements of the Division ergonomic policy have been communicated in all-hands meetings, and in various other communications such as the DSC's reports and emails to senior management.</p> <p>Specifically, early reporting and workload management have been addressed in All Hands meetings (where ergonomics is a common topic). These concepts are also a common discussion point, and often part of the root cause and corrective actions associated with our ergonomic injury investigations.</p> <p>D7c. Ergo Self-Assessment training, EHS0059, completion rate is 95%.</p> <p>Worksmart Ergonomics training, EHS0062, completion rate is 76%. (This low completion rate for</p>

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	<p>required ergonomics training?</p> <p>V7d. How timely are our ergonomic evaluations?</p> <p>Review of Ergo Advocate Program</p> <p>V7e. Did our division participate in the Ergo Advocate Program?</p> <p>V7f. What were the results of our participation?</p> <p>Review ergonomics database.</p> <p>V7g. Did we complete ergonomic corrective actions?</p> <p>V7h. How timely is implementation of corrective actions?</p>	<p>EHS0062 is at least partly due to classes rapidly filling to capacity and not enough class offerings during this past Summer and Fall.)</p> <p>D7d. Data not pulled.</p> <p>D7e. EETD has an in-house Ergo Advocate team of 4 trained evaluators. EH&amp;S evaluators are used for more critical evaluations where there are injuries, discomfort, or other complexities involved. In-house evaluators are primarily used for the routine evaluations and follow-up work. The team is working towards having workstation evaluations completed for all approximately 182 active career or term EETD staff. Requests from staff or EH&amp;S for ergonomic evaluations are given first priority.</p> <p>D7f. Current data has not been pulled. However, at the beginning of FY08, 222 Division personnel had ergo evaluations (EHS0068).</p> <p>Due to the cost and person-hours required for the new Ergo Advocate Program, EETD's team of trained evaluators was reduced from 11 to 4. This slowed down progress significantly with completing non-critical evaluations. There was also a significant delay in conducting evaluations between the time when the new Ergo Advocate Program was enacted and when team members completed their training. Once the Ergo training was completed, evaluations continued with the "revised" ergonomic tools. Evaluators were a little unsure about the 1st initial evaluations, so these were conducted with the EH&amp;S Ergo staff. Generally results were positive. Staff felt good about the information taught in the classes. The information is useful in conducting ergo evaluations.</p> <p>D7g. Data not pulled.</p> <p>D7h. Data not pulled.</p>
What noteworthy		EETD has a well-organized tracking and filing system for all formal authorizations. All formal

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<p>accomplishments in the ISM core function #3, <i>Control Hazards</i> did we achieve?</p> <p>What opportunities for improvement in the ISM core function #3, <i>Control Hazards</i> exist?</p>		<p>authorizations were reviewed on time with 2 minor exceptions. Capturing changes in work scope that may effect formal authorizations is accomplished by keeping PIs educated on these requirements and by frequent walkthroughs, particularly by the DSC. The Division has a proactive ergonomic action plan and policy that dates back to 1999.</p>
4. PERFORM WORK		
<p>E8. Work is performed within the ES&amp;H conditions and requirements specified by Lab policies and procedures. Performance criteria include work authorizations (including but not limited to JHAs, AHDs, BUAs, RWAs); work permits (including but not limited to confined space, energized electrical work); waste management criteria (SAAs, waste sampling, NCARs); and environmental permits and management criteria (resource conservation, pollution prevention and waste minimization).</p>	<p>V8a. What are our formal work authorizations?</p> <p>V8b. Did we perform work within the scope of our formal authorizations and hazardous work permits? How do we assure work is performed within scope?</p> <p>V8c. Did we complete and document on-the-job training as required by our formal work authorizations?</p> <p>V8d. How do we assess SAA compliance?</p>	<p>D8a. EETD has 11 AHDs, 1 RWA, 1 SSA, 7 GLAs, and 1 X-Ray authorization. Details on these authorizations are in the DSC's files and summarized in a database kept by the DSC. This database includes review dates, number of users, total courses needed under the authorization, and number of courses completed.</p> <p>D8b. 100% compliance for 11 active AHDs 100% compliance for 1 active RWA 100% compliance for 8 SSAs &amp; GLAs 100% compliance for 1 active X-Ray authorization</p> <p>Formal authorizations are reviewed and renewed every 12 months for AHDs, 18 months for RWAs and SSAs, and 5 years for X-Ray authorizations. Assurance that work is being performed within the scope of the authorization is primarily through these periodic reviews. PIs are also well informed that any significant change in hazards or scope of work must be reviewed by EH&amp;S staff. Additionally, regular DSC walkthroughs and PI self-assessments provide a check that no work is being conducted outside of the scope of the authorization. As stated in the EETD ISM Plan, until training requirements for the authorization have been established and satisfied, individuals are not allowed to work under the authorization.</p> <p>D8c. OJT is required for all formal authorizations except for GLAs. OJT is documented in the Notes section under the Users section of each AHD, in the Sealed Source Journal for SSAs, in the RWA Journal for RWAs, and in the X-Ray Journal for X-Ray authorizations.</p> <p>D8d. All SAAs are formally inspected quarterly by the DSC and the EH&amp;S Waste Generator Assistant.</p>

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E9. Staff (including employees, participating guests, students and visitors) is properly trained.	<p>What is our compliance rate?</p> <p>V8e. Did we receive any notices of violation from external regulatory agencies? If so, did we implement corrective actions?</p> <p>V9a. What percentage of our staff completed the JHQ in the past 12 months (in cases where the JHA process is not implemented)?</p> <p>V9b. What is our required training completion rate?</p>	<p>They are also inspected during walkthroughs by the PI and DSC.</p> <p>88% of EETD's 30 SAA were in compliance during the quarterly inspections for FY08.</p> <p>100% of the waste samples tested in the waste QA program were in compliance. This represents a tremendous improvement over the previous 2 years where EETD had red scores for waste QA.</p> <p>D8e. EETD has had no NCARs, environmental, or other external violations issued during this performance period.</p> <p>D9a. The JHA is fully implemented in EETD. JHQ statistics are no longer relevant.</p> <p>The overall compliance rate for JHAs was 98% on 10/1/08 and is 96% as of 12/15/08. (The JHQ compliance rate was 92% at the end of FY07.)</p> <p>D9b. The completion rate for required training courses was 89% on 10/1/08 and is 95% as of 12/15/08. (The completion rate was 92% at the end of FY07.)</p>
<p>What noteworthy accomplishments in the ISM core function #4, <i>Perform Work</i> did we achieve?</p> <p>What opportunities for improvement in the ISM core function #4, <i>Perform Work</i> exist?</p>		<p>All formal authorizations were in compliance. Waste QA had a 100% pass rate – a great improvement over red scores for the 2 prior years. EETD received no NCARs or other external violations.</p> <p>Division efforts to improve waste management compliance succeeded with significantly improving waste Quality Assurance compliance, but failed to improve SAA compliance.</p>
<b>5. FEEDBACK AND IMPROVEMENT</b>		



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E10. Division implements an effective safety walkaround program per the requirements of the Division ISM Plan. Ensure all personnel required to perform safety walkarounds, as defined in the Division ISM Plan, have completed EHS 27 Performing an Effective Safety Walkaround.	V10a. Did we document walkaround requirements in our Division ISM Plan?	D10a. The EETD ISM Plan specifies walkaround requirements for PIs (quarterly), Senior Management (recommended quarterly), and the DSC (a graded approach, averaging quarterly or more frequently).
	V10b. Have all personnel required to perform safety walkarounds, as defined in the Division ISM Plan, completed EHS 27, "Performing Effective Safety Walkarounds"?	D10b. Data not available.
	V10c. Did personnel perform assigned walkarounds as scheduled? How were results recorded? Are results recorded consistent with the Division ISM Plan?	D10c. 97% of the annual Self-Assessment Checklist packages (which are completed by the PI and/or Work Lead) were completed by the Division's research facilities during this review process.  100% of the Division's lab space was inspected by the DSC at least once and typically about quarterly during the review period.  PIs conduct quarterly walkthroughs of their spaces using the EETD Lab Safety Inspection Checklist ( <a href="http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls">http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls</a> ). The completed checklists are kept in a document pocket inside the door of their labs. Issues not corrected on the spot are entered into CATS.  All senior Division management (including the Division Director, Assistant Division Director, and Department Heads) are informed of the expectation to do periodic walkthroughs of their spaces, recommended quarterly. All Senior Division Managers have done at least one walkthrough during this review period with the possible exception of one Department Head who is not available for poling.  Most of the Division office space has been inspected by the DSC, Department Heads, and Supervisors on a graded as-needed basis, and is generally only documented when deficiencies exist.
	V10d. Were all safety deficiencies not corrected on the spot documented? How?	D10d. It is Division policy that deficiencies that are not fixed on the spot should be tracked in CATS. This includes deficiencies from Occurrence Reports, environmental inspections, and MESH reviews. However, early in the review period there were some low hazard deficiencies that had been tracked (and closed) outside of CATS, including some SAAR corrective actions. In the latter part of the FY08 review period, all deficiencies were being tracked in CATS.



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E11. Division performs a thorough review of all accidents, injuries, incidents, near misses and concerns according to Lab policy and the division's ISM plan. Corrective actions to prevent recurrence are identified, effectively implemented, and shared via the Lab's Lessons Learned and Best Practices database, as appropriate.	<p>V11a. Is our process for investigating staff injuries and accidents detailed in our ISM Plan?</p> <p>V11b. Did we follow this process?</p> <p>V11c. Review injury and accident reports (SAARs).</p> <p>V11d. How effective were our corrective actions?</p> <p>V11e. Did we share lessons learned with others via the Lab's Lessons Learned and Best Practices database? Did we apply any lessons learned from the Lessons Learned and Best Practices database that may help reduce injuries?</p>	<p>D11a. The EETD ISM Plan specifies the process for investigating injuries and accidents in Sect. 5. It is Division policy to have an accident investigation meeting with each injured person, their supervisor, the DSC, and the EH&amp;S Division Liaison. For DOE recordable injuries, the ADD will also be involved in these meetings and a summary is presented to the Division Safety Committee. The DSC and EH&amp;S Division Liaison review all SAARs to assure that accident causes and corrective actions are adequately defined. Identification of accident causes and corrective actions entered on the SAARs report are often revised and improved during the investigation and follow-up meetings. Each accident and injury file is kept active by the DSC until corrective actions are implemented.</p> <p>All meetings with accident and injury discussions include active promotion of early reporting, with a particular emphasis on ergonomic issues.</p> <p>D11b. Yes, the process was followed and documented in a spreadsheet maintained by the DSC.</p> <p>D11c. The DSC and EH&amp;S Division Liaison review all SAARs to assure that accident causes and corrective actions are adequately defined.</p> <p>D11d. Each accident and injury file is kept active by the DSC until corrective actions are implemented. Corrective Actions are tracked in CATS.</p> <p>D11e. EETD regularly produced lessons learned that are disseminated by way of the Lab's Lessons Learned database.</p> <p>Unknown whether any lessons learned were applied in a manner that helped reduce injuries.</p>
E12. ES&H deficiencies that	V12a. How do we	D12a. It is Division policy that deficiencies that are not fixed on the spot should be tracked in CATS.

EXPECTATION	VALIDATION	DIVISION SYSTEMS
cannot be resolved upon discovery are entered in CATS in a timely manner and tracked to resolution. Deficiencies include those from workspace inspections, self-assessment activities, SAARs, Occurrence Reports, Non-compliance Tracking System Reports, environmental inspections, Division Self-Assessment, EH&S technical reviews, Management of ES&H (MESH) Reviews, and external appraisals.	<p>assure that deficiencies identified from workspace inspections, self-assessment activities, SAARs, Occurrence Reports, Non-compliance Tracking System Reports, environmental inspections, Division Self-Assessment, EH&amp;S technical reviews, Management of ES&amp;H (MESH) Reviews, and external appraisals are entered in CATS in a timely manner?</p> <p>V12b. How did we address opportunities for improvement identified in FY07 self-assessment (division self-assessment, MESH, ESH Technical Assurance)? A CATS report may suffice as a response.</p> <p>V12c. What is our</p>	<p>This includes deficiencies from walkthroughs, Occurrence Reports, SAAR reports, environmental inspections, and MESH reviews. However, early in the review period there were some low hazard deficiencies that had been tracked (and closed) outside of CATS, including some SAAR corrective actions. In the latter part of the FY08 review period, all deficiencies were being tracked in CATS.</p> <p>The Division has made significant improvements with getting issues and corrective actions entered into CATS. However, the complexity of the CATS system continues to be an impediment to full implementation. Although each institutional upgrade to CATS has made the system more encompassing and powerful with its new data entry and analysis features, the Division is concerned that the time it takes to enter each deficiency into the system also increases with each upgrade, further straining division resources. This year, with the increased number of audits, reviews, and lab stand-downs, most of the burden of entering issues into CATS had to be passed on from the DSC to the users. Initially, about 80% of the user CATS entries were incomplete or improperly entered to the point where the issue failed to progress through the system. The DSC wrote a <a href="#">CATS Primer</a> document that was distributed to PIs and Work Leads, and posted on the EETD ES&amp;H website. This resulted in entry errors dropping to low numbers and improved compliance with getting CATS entries in a timely manner.</p> <p>D12b. Thorough details on how opportunities for improvement identified in the FY07 self-assessment were addressed are given in Sect. II.2 of this report. CATS was not used.</p> <p>D12c. 94% Closure rate for all CATS findings for FY08.</p>

EXPECTATION	VALIDATION	DIVISION SYSTEMS
	<p>CATS completion rate (regardless of schedule)?</p> <p>V12d. What is our CATS on-time completion rate (excluding entries sent to the Work Request Center)?</p>	<p>D12d. Data not pulled.</p>
<p>What noteworthy accomplishments in the ISM core function #5, <i>Feedback and Improvement</i> did we achieve?</p> <p>What opportunities for improvement in the ISM core function #5, <i>Feedback and Improvement</i> exist?</p>		<p>EETD's accident and injury investigation program is thorough and conducted as per the ISM Plan. CATS closure rate for FY08 was 94%.</p> <p>In most cases, Senior Management walkthroughs were not conducted quarterly as recommended (or at least were not consistently documented). (Consideration is being given to revise the Division ISM Plan to have more structured Division Senior Management walkthroughs but on a less than quarterly basis.) Implementing opportunities for improvements and recommendations from the FY07 SA Report were mixed and are currently ongoing.</p>

## **IV. Division ES&H Program Implementation Plan for FY09**

### *FY09 Quarter 1 (October - December)*

- Distribute Self-Assessment report to Division Management and discuss with Division Council.
- FY08 SA follow-up: verify corrective actions and follow-up on issues raised.
- Submit quarterly Training Report to Division Supervisors.
- Conduct SAA assessment, in conjunction with EH&S.

### *FY09, Quarter 2 (January - March)*

- Submit FY09 1<sup>st</sup> Quarter Division Safety Report to the Safety Committee and Division Management, and discuss with Division Council. (May be superseded by other reports.)
- Submit quarterly Training Report to Division Supervisors.
- Conduct SAA assessment, in conjunction with EH&S.
- Implement new LBNL PPE Policy in technical areas within EETD

### *FY09, Quarter 3 (April - June)*

- Submit FY09 2<sup>nd</sup> Quarter Division Safety Report to the Safety Committee and Division Management, and discuss with Division Council. (May be superseded by other reports.)
- Submit quarterly Training Report to Division Supervisors.
- Conduct SAA assessment in conjunction with EH&S.

### *FY09, Quarter 4 (July - September)*

- Submit FY09 3<sup>rd</sup> Quarter Division Safety Report to the Safety Committee and Division Management, and discuss with Division Council. (May be superseded by other reports.)
- Submit quarterly Training Report to Division Supervisors.
- Evaluate JHA compliance, and review training completion for all employees and guests as part of the PRD process.
- Conduct annual Self-Assessment of division research facilities, including update of the HMS and chemical inventory databases as a review of hazards.
- Confirm Authorization reviews are current.
- Prepare annual SA report on Division ES&H activities.
- Conduct SAA assessment in conjunction with EH&S.

## **V. Appendices**

## ***Appendix 1. Documents Available Online***

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EETD ES&H Website

<http://eetd.lbl.gov/EHS/EHS.html>

EETD Integrated Safety Management (ISM) Plan

<http://eetd.lbl.gov/EHS/safety/eetd-ism-plan.html>

EETD Lab Safety Inspection Checklist

<http://eetd.lbl.gov/EHS/docs/eetd-lab-insp-checklist.xls>

EETD Abbreviated 2008 Self-Assessment Checklist

[http://eetd.lbl.gov/EHS/docs/2008SA\\_ChecklistEETD.xls](http://eetd.lbl.gov/EHS/docs/2008SA_ChecklistEETD.xls)

Corrective Action Tracking System (CATS) Primer

<http://eetd.lbl.gov/EHS/docs/cats-primer-eetd.pdf>

Project Safety Review (PSR) form

<http://eetd.lbl.gov/EHS/chem-hazards/docs/psr.rtf>

Synopsis of PPE and food policy

<http://eetd.lbl.gov/EHS/docs/ppe-food-policy-synopsis.pdf>

DOE HSS audit preparation documents

<http://eetd.lbl.gov/EHS/stand-down.html>

Acronyms used in EETD

<http://eetd.lbl.gov/EHS/safety/eetd-ehs-acronyms.html>

What's New in EETD newsletters

<http://eetd.lbl.gov/LabOnlyWS/Intranet/Subpages/News/WhatsNew/index.html>

## **Appendix 2. Sample Safety Communications & Other Supporting Documents**

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### **A2.1. "EETD Quarterly SAA & Waste Management Newsletter" - Sample**

Date: July 16, 2008

To: EETD SAA Responsible Persons

CC: PIs with SAAs and Other Interested Parties

This is my quarterly reminder to you to please **check your SAAs** to make sure they are compliant. Now may be a very good time to **submit a requisition** to have your waste picked up, and make sure it doesn't go over the time limit. Here are some of the **common problem areas** that you should check (there is one new item in this list - can you spot it?):

- All flammable liquid wastes greater than 1 quart must be stored in approved safety container (red flam can).
- Liquid wastes and any wastes in glass containers must have secondary containment.
- No containers older than 9 months from the "start date" (don't wait until the last minute).
- Hazardous Waste labels are on all containers and they are completely filled out.
- No waste containers out of the SAA unless under immediate control of a generator and in same or adjoining room as the SAA. (The properly labeled waste container must be returned to the SAA when the user leaves the room.)
- No non-waste containers in the SAA (which should be clearly delineated).

**Results from our last quarterly inspections in April were fair.** One SAA had greater than 1 quart of flammable liquid waste in a glass jug. Another SAA had properly labeled baggies for solid waste, but the baggies were not closed. And a third SAA had a bottle of acetone in the SAA that wasn't waste, and they had an unlabeled baggy containing a small circuit board (presumably Universal Waste) in the SAA.

**Chemical Transport Incident.** Recently an EETD researcher accidentally left some packaged vials of relatively harmless (but inadequately labeled) chemicals in the cafeteria. This caused concern with some of the cafeteria workers. The incident was reported up the chain of command, including DOE. As a result of this incident, the Lab is working on a clarification of regulations and procedures for transporting small quantities of chemicals between non-adjacent lab buildings, and to and from offsite locations. In the mean time, when transporting small quantities of chemicals, do not take them to areas where there is food (such as cafeterias, offices, or areas within labs where food or drink is consumed), be sure the containers are labeled to indicate contents and hazards, be sure containers are closed tightly, and package the containers adequately to prevent breakage or spills (including secondary containment for liquids). Transporting larger quantities of hazardous materials should be done by the Transportation Department or the EH&S Waste Management Group, as detailed in the Chemical Hygiene and Safety Plan, [http://www.lbl.gov/ehs/chsp/html/procure\\_trans.shtml#Transportation](http://www.lbl.gov/ehs/chsp/html/procure_trans.shtml#Transportation).

**Waste Quality Assurance (QA) Performance:** In FY06 and FY07, EETD had red scores for our waste QA performance. But so far this year (starting 10/1/07), we've had a 100% pass rate for Waste Management's random sampling of our waste containers. This means that our waste generators are doing a much better job with accurately identifying the contents of their waste containers. Congratulations! I'm also noticing that although the number of waste containers produced Lab-wide has dropped compared to last year, the percentage drop in EETD is much higher. There may be a number of reasons for this, but one reason may be that we are doing a better job with waste minimization this year.

**Reminders Regarding the Recent ES&H Crackdown/Cleanup:** By now, all labs should have 1) the new placards showing hazards and contact information posted on the wall outside the lab; 2) the new plastic

document holder mounted inside the lab near the door with key documents (such as inspection results, safety procedures, interlock checks, etc.) or at least a reference to where these documents are kept (e.g. a lab notebook or online authorization database); 3) housekeeping issues taken care of; and 4) recent documented safety walkthroughs by Line Managers. Also, all personnel should have submitted their JHA or plan on doing so soon. (Note that this is a 3-step process: 1) Employee submits JHA; 2) Supervisor reviews, customizes as appropriate (especially important for those doing experimental work), and electronically approves the employee's JHA; and 3) The employee electronically countersigns their JHA (to acknowledge changes made by the supervisor).)

**The next quarterly SAA inspections will be tomorrow (Thursday) morning.** If you have any questions about your SAA or waste, check the resources listed at the bottom of this email, or catch Howard Hansen or me during our walkthroughs.

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**For more information about SAAs and hazardous waste:**

An excellent reference is PUB-3092, Waste Generator

Guidelines, [http://www.lbl.gov/ehs/waste/wm\\_pub\\_3092.shtml](http://www.lbl.gov/ehs/waste/wm_pub_3092.shtml).

The LBNL Waste Management Group website at <http://www.lbl.gov/ehs/waste/index.shtml>.

The LBNL EH&S website at <http://www.lbl.gov/ehs/>, click on the "SAA" Quick Link in the lower left corner.

The [SAA Reminder Poster](#), which should be posted at each SAA.

For questions, call myself or [Howard Hansen](#), our Waste Generator Assistant, at x5867.

**\*Guy Kelley**

*EETD Safety Coordinator*

90-2056B, MS 90R3027D

x4703

## A2.2. "EETD Offsite Safety Review" form – Sample

### EETD Off-Site Safety Review

Date: Saturday, October 27, 2007 Off-site Project No.: 8  
 PI #1: Marc Fischer EETD Facility No.: 33  
 PI #2: \_\_\_\_\_ Facility Work Leader: Marc Fischer  
 EETD Off-Site Work Contact/Responsible Person: Marc Fischer  
 Office Location: 90K-125 Phone Nos.: x5539  
 Off-Site Company/Institution: Richland Tower  
 Off-Site Location: 1650 Levee Rd., - Walnut Grove, California 95690  
 Date Work Expected Start: 9/20/2007 Expected End Date: NA  
 Off-Site Work Description/Summary: \_\_\_\_\_  
 Gas sampling and analysis to determine gas concentrations in ambient air

#### Authorizations -- Does this off-site work need/have the following:

Activity Hazard Document (AHD)? ☐ yes ☐ no ☒ don't know  
 Radiological Work Authorization (RWA)? ☐ yes ☒ no ☐ don't know  
 Sealed Source Authorization (SSA or GLA)? ☒ yes ☐ no ☐ don't know  
 Other safety documents or environmental permits? ☐ yes ☐ no ☒ don't know  
 Specify: \_\_\_\_\_

**Hazards.** In the table below, indicate the primary hazard(s) and, if they exist, any secondary hazard(s).  
 Secondary hazards are those arising from "incidental" or very occasional use (e.g., small bottles of compressed gas used for a GC, occasional use of hand tools, use of sealed radioactive sources as part of an instrument, etc.).

Hazard Category	Date if New	Primary (check one or more) (circle single most significant)	Secondary (check all that apply)
Bio-hazards			
Compressed gases (use of cylinders, regulators, etc.)		X	
Confined space/possible oxygen deficiency			
Electrical (hazardous voltage/current, stored energy)			
Ergonomics (computer use, repetitive motion)			
Fire – flammable gas/liquid			
Hand tools			
Hazardous chemicals (e.g. toxic, carcinogenic, flam.)			
Hazardous, mixed, or radioactive waste			
Heavy objects (heavy manual lifting, use of crane, etc.)			
High pressure (>150 psi gas (not incl. std. cylinders with regulators adjusted to <150 psi), or >1500 psi liq)			
High or low temperatures (>100 C or cryogenic fluids)			
Laser (class 3b or 4)			
Machine tools (drill press, lathe, etc.)			
Noise			



Radiation (sealed sources, isotopes, UV, X-Ray, etc.)		X	
Stored Energy (e.g. fans, moving equip., capacitors)			
Work from heights (incl. use of ladders, elevated surfaces)			
Other (specify):			

## Authorized Off-Site Workers and Training

Only the users listed below are authorized to work off-site on this project. User's signature below indicates that the user

1. has read this Off-Site Safety Review document and understands the hazards present,
2. has received any necessary site or job specific training by the PI, EETD Off-Site Responsible Person, and/or local institution safety representative, including the identification of hazards and mitigation measures,
3. has completed required training as per their LBNL JHQ or will work only under direct supervision of a trained employee until training has been completed.
4. has the necessary personal protective equipment (PPE) (such as safety glasses, safety shoes, gloves, hard hat, lab coat, etc.) to conduct their work safely, and
5. if actively working off-site, agrees to attend periodic safety meetings as per the schedule below.

Off-site work start-to-finish time	Recommended minimum safety meeting and document review frequency
< 1 Month	Daily
1 to 3 Months	Weekly
> 3 Months	Monthly

The periodic safety meetings will be conducted by the PI, the EETD Off-Site Responsible Person, the local institution safety representative, or their designate. The agenda will include at least the following:

- Review this document for accuracy, paying particular attention to the identification of any new hazards and updating the list of off-site workers.
- Review mitigation measures for all hazards.
- Review any critical procedures for the off-site operations.
- Assure all off-site personnel have the proper PPE.
- The work will not significantly increase risk to the environment, public or other personnel.

Name	Initial Signature & Date	Periodic Safety Meetings and Document Reviews (Date & Initial)						
		Date:	Date:	Date:	Date:	Date:	Date:	Date:
P.I. #1:								
Marc Fischer								
P.I. #2:								

<i>Off-site work contact/resp. person:</i>								
<i>Off-site personnel:</i>								

**Retain the original and send one copy to: Guy Kelley, 90R3027D, x4703, GOKelley@lbl.gov**

### ***Appendix 3. Acronyms and Glossary of Terms***

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(See also <http://eetd.lbl.gov/EHS/safety/eetd-ehs-acronyms.html>)

- ADD:** Assistant Division Director for ES&H and Space – Robert Kostecki.
- AHD:** Activity Hazard Document. Used to document hazards and procedures for projects that involve medium and higher hazards.
- CATS:** LBNL Corrective Action Tracking System.
- CMS:** Chemical Management System. (<http://cms.lbl.gov>)
- DART:** Days Away, Restricted or Transferred case rate.
- DSC:** Division Safety Coordinator -- Guy Kelley.
- EH&S:** Environment, Health, and Safety (Department or Division)
- ES&H:** Environment, Safety, and Health (Program)
- FY:** Fiscal Year.
- GLA:** Generally Licensed Authorization. Covers low hazard radioactive sources.
- HEAR:** Hazards, Equipment, Authorizations & Review Database. Division scope of work and inventory of hazards, equipment, and authorizations. Superseded by HMS.
- HMS:** Hazard Management System. Replaces HEAR. Inventory of hazards and special equipment.
- IH:** Industrial Hygiene. Typically refers to the Industrial Hygiene group of the EH&S Division.
- ISM:** Integrated Safety Management. The EETD Division ISM Plan is available on the web at <http://eetd.lbl.gov/EHS/safety/eetd-ism-plan.html>.
- JHA:** Job Hazards Analysis system. Required for every employee. Forms Work Authorization.
- JHQ:** Job Hazard Questionnaire. Superseded by JHA.
- NCAR:** Nonconformance and Corrective Action Report. Commonly used for serious violations of SAA and waste handling guidelines.
- OCA:** Office of Contract Assurance.
- ORPS:** Occurrence Reporting and Processing System.
- PSR:** Project Safety Review. All continuing and proposed projects fill out the PSR form as part of the project renewal or proposal process (in addition to the NEPA/CEQA forms). See the PSR FAQ on the EETD ES&H webpage for further information.
- PY:** Performance Year. PY07 was an unusual 15 months long, from 7/1/06 to 9/30/07. This was due to alignment of the PY to match the FY.
- QA:** Quality Assurance. In this report primarily refers to proper chemical waste characterization.
- RWA:** Radiation Work Authorization.
- SAA:** Satellite Accumulation Area.
- SSA:** Sealed Source Authorization.
- TRC:** Total Recordable Case rate.